

MULTICARE X

LINET

Turn to Better Care



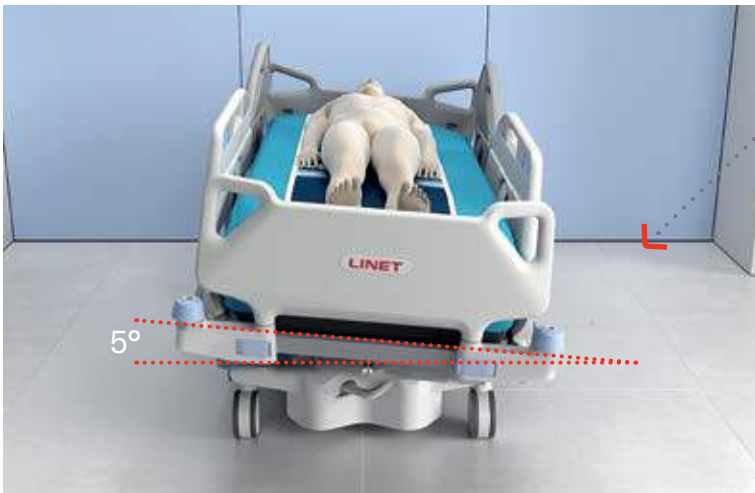
Premium ICU Bed Designed by Nurses for Nurses

DISCOVER THE EFFECTS OF FRAME-BASED LATERAL TILT



Improve Pulmonary Outcomes

The frame-based lateral tilt guided by Electrical Impedance Tomography provides support for pulmonary complications of patients and provides immediate feedback on the treatment.



Moving Immobile Patient

Microshifting, gentle, and precise step-by-step lateral tilt, enables the positioning of haemodynamically unstable patients while maintaining their spinal alignment.





Watch the video



Mobilizing Patient Early

The lateral tilt ensures ergonomic position nose over toes and Mobi-Lift® handle reduces effort of standing up for patient as well as the number of caregivers required to support early mobilization.



Easier Patient Transfer

Frame-based lateral tilt enables easier and smoother patient transfer.



Safe Patient Handling

Frame-based lateral tilt reduces the risk of injuries for caregivers, and makes routine care tasks easier and safer.

TURN TO BETTER CARE

Enhanced Patient Outcomes



Improve Pulmonary Outcomes

Frame-based lateral tilt with programmable Automatic Lateral Therapy, guided by Electrical Impedance Tomography supporting the reduction of complications associated with mechanical ventilation.



Early Mobilization

Our Early Mobilization Program, featuring Mobi-Lift® handle or lateral tilt, can contribute to better and faster patient recovery.¹



Pressure Injury Prevention

New generation of integrated mattress Opticare® X is fully automatic allowing the adjustment of mattress settings by the press of a single button to support individual patients clinical conditions and repositioning.



Falls Prevention

Safety concept of the siderails, automatically engaged i-Brake® and multizone bed exit alarm keep the patient and caregivers safe in every situation.



Improve Patient Experience

Features such as Ergoframe®, Opticare® X Mobile Mode and USB integration support patients physically and psychologically, improving their well-being and enhancing recovery.





Improved Caregiver & Hospital Workflow



Safe Patient Moving & Handling

Frame-based lateral tilt makes it easier and safer for caregivers to provide daily care and reduces the physical strain for caregivers.



Easy Patient Transportation

Easier transportation thanks to motorized 5th castor with i-Drive Power[®] together with 30% lighter bed frame.



Simplify Caregiver Procedures

Intuitive and predictive controls of bed and integrated mattress on one screen make caregivers effective and efficient even in the advanced procedures.



Hospital Operations Efficiency

Smart care solution LINIS SafetyPort[®] collects data from multiple data points of the bed and gives overview about patients and helps with administrative tasks.



IMPROVE PULMONARY OUTCOMES

Individualized support of pulmonary outcomes by the use of programmable **Automatic Lateral Therapy (ALT)** and **Electrical Impedance Tomography (EIT)**.



CHALLENGE

- Mechanical ventilation complications
- Lung overdistension, barotrauma, lung collapse, and blood desaturation
- The daily costs of ventilating patients equates to:
 - \$1,909 – 2,304/day in the US²
 - £1,738/day in the UK³
 - €1,580 – €1,654/day in Europe⁴

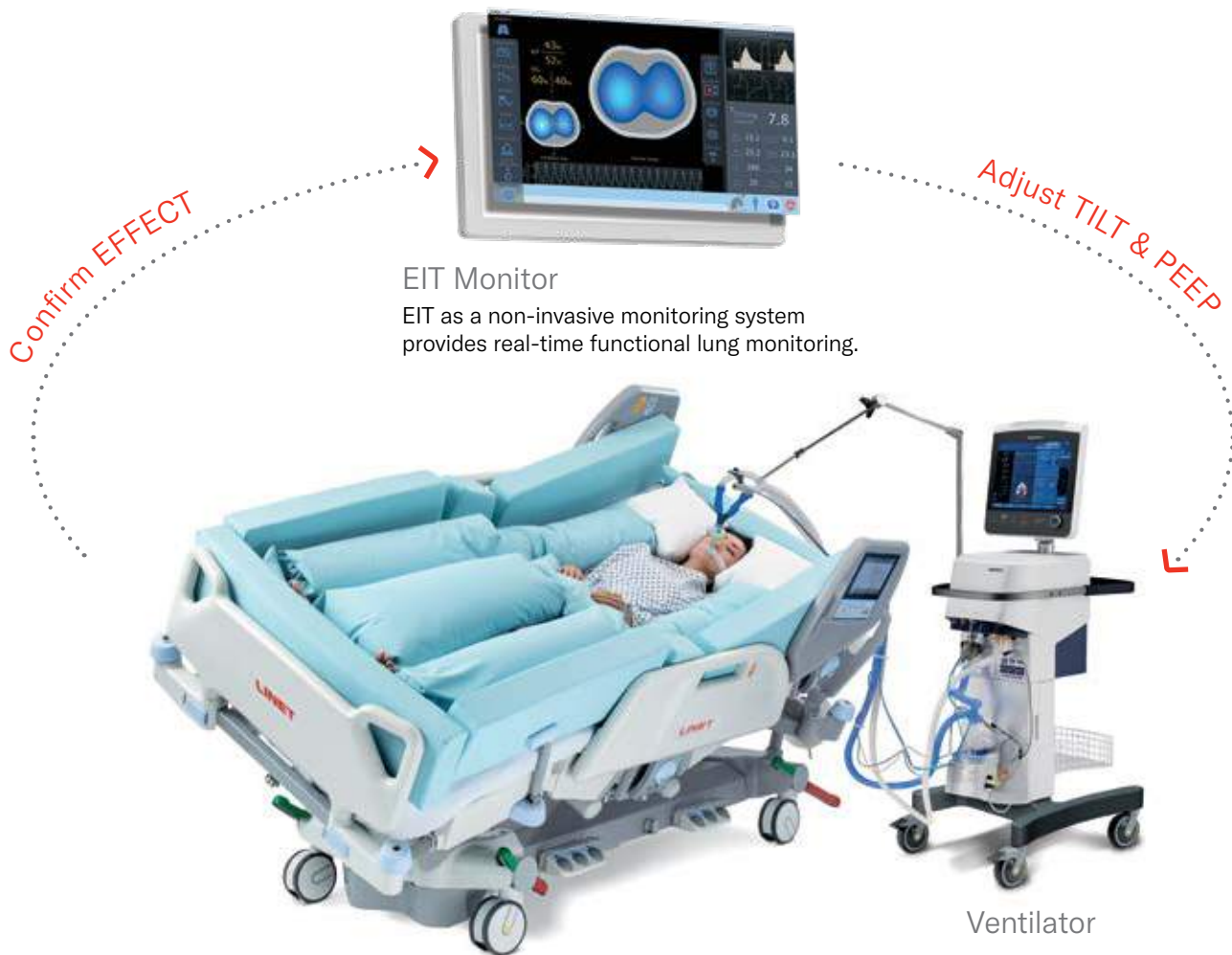
SOLUTION

40% Functional residual capacity gain when using Automatic Lateral Therapy (ALT) guided by Electrical Impedance Tomography (EIT).⁵

ALT guided by EIT allows precise ventilation management that is

- Individualized
- Timely
- Continuous
- Targeted
- Gentle
- Radiation-free

Synergy between the two complementing technologies (AIT & EIT) creates a closed loop system which allows individualized medical intervention by precise positioning with immediate feedback by real-time visualisation on the effect of therapy.



Multicare® X with ALT

Precise and individual adjustment of the lateral tilt allows you to change the ventilation distribution and helps with lung collapse.



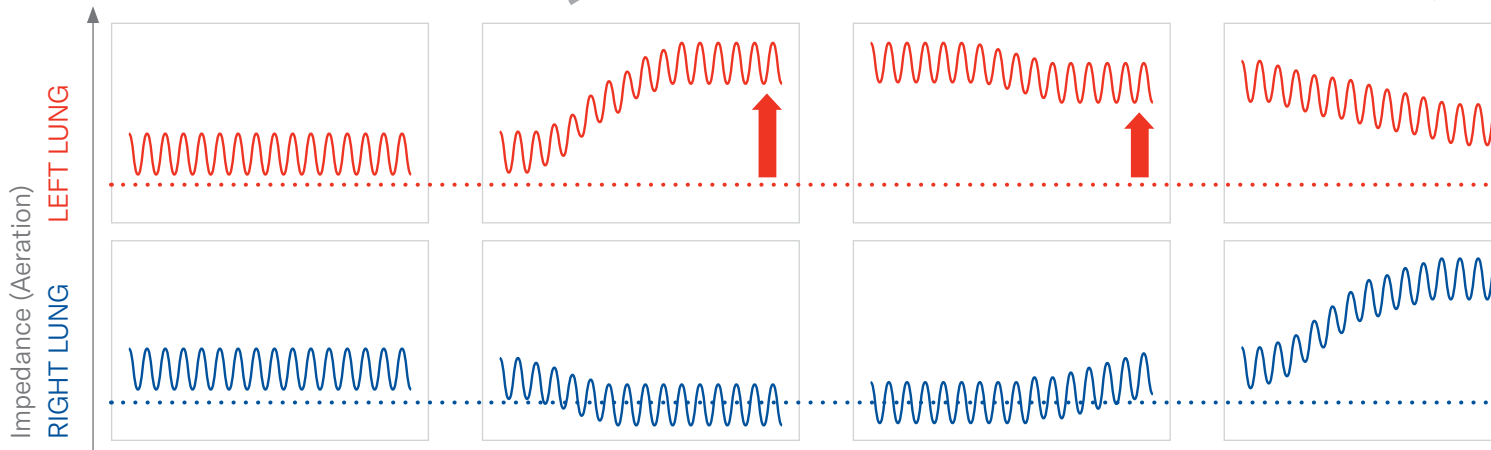
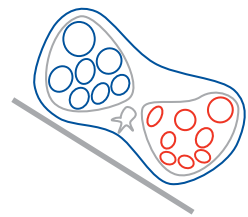
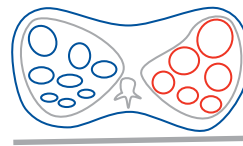
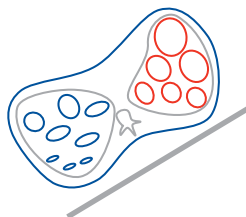
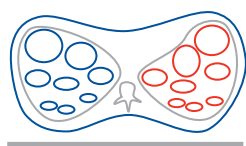
INDIVIDUALIZED RESPIRATORY CARE

Supine
Poorly aerated
ALI/ARDS lungs

Right tilt
Increased aeration in
upper lung (left)

Supine
Increased overall aeration

Left tilt
Increased aeration in
upper lung (right)



Initial status. The impedance (that reflects aeration) of each lung is provided in a separate graph for clarity – these values may overlap. The oscillation is tidal volume.

The upper lung (left) gains volume due to increased transpulmonary pressure (P_{tp}). Adequate Positive End-Expiratory Pressure is necessary to prevent the lower lung from derecruitment.

After the return to supine, the lung may lose some volume but is still recruited relative to the initial status. **Red arrow** represents the volume gain.

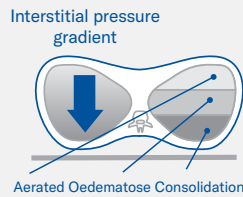
Now the right lung is the upper lung and gains volume due to increased (P_{tp}). **The blue arrow** represents the volume gain of the right lung relative to the initial status.



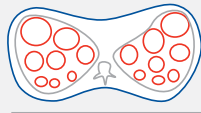
Lateral Tilt Physiology

Supine

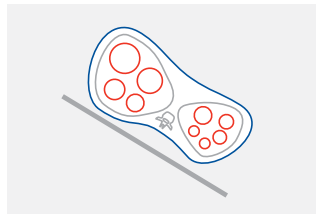
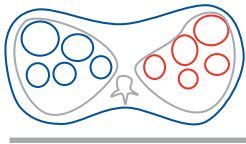
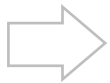
Increased overall aeration



Hospital Acquired Pneumonia (HAP) and Ventilator Acquired Pneumonia (VAP) are common complications in critically ill patients. This can lead to collapse of lung or lobes of the lung and non-homogeneity of the lungs.

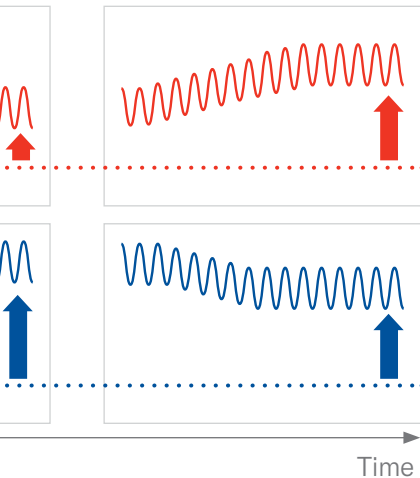


In lateral tilt the same principles apply. Hence the upper lung tends to be more distended. (illustrated schematically and in EIT image) This distending pressure can serve as an opening maneuver. However, adequate PEEP must be set to prevent the lower lung from collapse.



Consequently, the alveoli in the lower (dependent) regions are less distended than ventral ones and may even collapse. On the contrary, the upper (nondependent) regions may be overdistended.

Solution Attributes



After the return to supine, both lungs may exhibit recruitment. The red and blue arrows represent the volume gain.



Prone Position

New mattress mode allows you to select a setting designed to aid prone nursing which can also be combined with Automatic Lateral Therapy.



Postural Drainage

Thanks to the combination of reverse Trendelenburg and lateral tilt, airway hygiene (postural drainage) can be easily performed.



EARLY MOBILIZATION

Our unique **Early Mobilization Program** with features such as **Microshifting** and **Mobi-Lift®** helps patients recover earlier and saves significant costs to the hospital.



CHALLENGE

- Up to 17 % of muscles atrophy after 3 days of immobility⁶
- Prolonged bed rest is a leading risk factor for developing several physical and psychological complications which delay the recovery process⁶
- Increased costs for the hospital



Learn more about
Early Mobilization
with LINET®



Read the full report:
Effect of Mobi-Lift® on
Patients' Mobilization



SOLUTION

28% shorter hospital stay in the ICU when implementing Early Mobilization Program⁷

Early Mobilization Program

See below a few examples of how Multicare® X can help in individual steps of Early Mobilization Program. To find all the benefits watch our Early Mobilization video or read the brochure.



Watch Early
Mobilization
Program video



Level 1: Moving Immobile Patient



Gradual lateral tilt by 1° at a time to gently and precisely position the patient (microshifting).

Level 2: Muscle Strengthening Exercises



Positioning of the bed to the desired position made easy thanks to one-button functions.

Level 3: Improving Patient Confidence



Sitting on the side of the bed or in cardiac chair position is an important part of the mobilization process. It can help to assess muscle strength and haemodynamic stability before ambulating patients.

Level 4: Helping Patient Stand Up



The unique foldable Mobi-Lift® handle along with other features can set the bed to an ideal height for standing to reduce the physical strain on the patient.

Less demanding standing procedure⁸

Bed with Mobi-Lift®
63% less muscular force needed for successful standing-up when using Mobi-Lift®.

F: 37%

Standard Bed
Standing up from the bed in the traditional way is more demanding on lower limbs muscles.

F: 100%



PRESSURE INJURY PREVENTION

The new fully-automatic Optimal Immersion mattress solution Opticare® X and 3-cell alternating Virtuoso® surface family bring advanced premium pressure care.



CHALLENGE

- Overall prevalence of pressure injuries at ICU lies somewhere around 27%⁹
- Pressure injuries (PI) can happen within 10 minutes of immobilization for patients with high-risk development of PI¹⁰
- Patients with HAPI have higher number of readmissions and higher mortality, mainly with category 4 mortality is around 22%. Treating HAPI can triple hospitalization cost¹¹

SOLUTION

Addressing the challenging topic of pressure injuries with combined solution of Multicare® X and fully automatic mattress Opticare® X allowing the **adjustment of the settings with the press of a single button from one screen.**

Sophisticated technology inside

Multicare® X & Opticare® X

Simple user interface outside

Multiboard X One-Touch Screen



One-Button Automatic Opticare® X's Modes

Optimize



Suitable for unconscious patients in a critical condition.

Mobile



Provides support for conscious and partially mobile patients during mobilization.

Prone



Provides optimal support for patients in prone position.

Max



The best choice for examination/moving & handling tasks.

Benefits of Multicare® X bed frame



Frame-based lateral tilt

- Supports patient positioning by making the patient turn 67% easier¹² and allows full unobstructed view of the patients' back and sacral area.
- Microshifting also allows gentle positioning of haemodynamically unstable patients.



Ergoframe®

Ergoframe® system reduces shear and friction between the patient and mattress during positioning of back and thigh rest.



OPTICARE X



Learn more about
Optimal Immersion
with LINET®



Fully automatic mattress **Opticare® X** allows the adjustment of settings easily from one screen to meet the current clinical needs of the patient.



Optimal Immersion

Optimal Immersion is designed to provide the most optimal pressure redistribution possible without a risk of bottoming out.



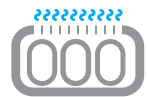
Integrated solution



Immersion & pressure redistribution



Automatic modes



MCM

Opticare® X Automatic Modes



OPTIMIZE

Maximum pressure redistribution thanks to immersion and envelopment ensured by patented technology by LINET® – Bottoming Out Detection System.



MOBILE

Right balance of air for pressure redistribution and stability support of mobile patients.



PRONE

Higher level of air to provide a balance between pressure redistribution and stability for patients being nursed in a prone positions.



MAX

Max inflate presents firm and stable support for patient care. After 30 minutes it automatically switches to the optimize mode to prevent the risk of pressure injuries.

Solution Features



Zoned Cover®

Dartex® Zoned Coatings by Trelleborg designed with glide centre for easier patient repositioning and “grippy” edges supporting safe patient mobilization.



Heel Zone

The heel section has a 7-degree slope and is lined with a softer foam that reduces pressure in high-risk area.



Discover more in
Virtuoso® brochure



VIRTUOSO

The **Virtuoso®** mattress system has been designed to meet the most demanding nursing needs when caring for patients with high risk of pressure injuries.

3-cell alternating technology

The patient body weight is distributed evenly across two thirds of the surface thus allowing the mattress to be soft and comfortable without compromising its clinical benefits.



Mattress replacement



3 cells alternating



Zero pressure



MCM



Virtuoso® Modes



Alternating

Alternating Pressure Therapy Mode can be used as part of prevention of skin breakdown related to pressure damage.¹³



CLP

Constant low pressure mode keeps the mattress pressure at the selected level. The pressure is checked every 30 seconds and adjusted if necessary.



MAX

Max inflate presents firm and stable support for patient care. After 30 minutes it automatically switches to the alternating mode to prevent the risk of pressure injuries.



Transport

Transport mode facilitates the transport of the patient in the bed as the mattress remains inflated when disconnected from the pump. Alternatively the pump with a battery allows transport of the patient in the set mode for up to 6 hours.



Microclimate Management

Microclimate Management helps maintain the natural thermoregulation by circulating air through the mattress surface.



CPR

Opticare® X's CPR valve and Virtuoso®'s CPR feature operated by one hand enable rapid deflation of the mattress in critical situations.



FALLS PREVENTION

Sophisticated features such as **siderails concept** and **i-Brake®** support patient's recovery in every situation.



CHALLENGE

- Patient falls are the most common adverse events reported in hospitals leading to up to 1 million of patient falls in the USA per year¹⁴
- Injury from falls can prolong hospital stay by 11.5 day on average¹⁵
- Almost every third fall in hospital leads to injury and the average cost for injury fall is \$ 14,056¹⁶
- Almost 75% falls are unwitnessed¹⁷

SOLUTION

Profound siderails concept, Multizone Bed Exit Alarm or i-Brake® – those are just a few solutions contributing to patient’s safety.

Multizone Bed Exit Alarm



Predicts situations when patient wants to leave the bed by monitoring their motion activity in two modes.

Siderails Concept



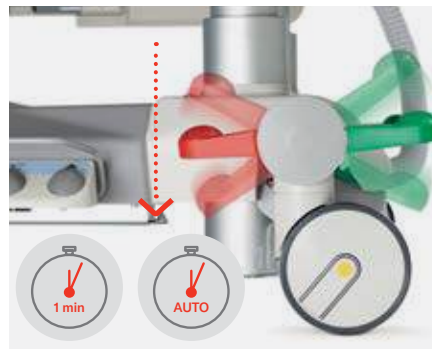
- Constant gap
- 45cm height allowing safe use of the highest mattresses
- 3/4 non-restrictive siderails
- Safety double mechanism
- Siderails down sensors

Opticare® X Zoned Cover®



Zoned Cover® designed to keep the centre of the mattress slippery with more “grippy” sides facilitating safe patient transfer.

i-Brake®



Automatically engaged brake mitigates the risk of patient fall caused by an unstable bed.

Patient Controls Lock



Disabling all patient controls with the press of a single button reduces the risk of unwanted positioning of the bed by the patient.



IMPROVE PATIENT EXPERIENCE

Features such as **Ergoframe®**, **Opticare® X Mobile Mode** and **USB integration** can support patients physically and psychologically, improving their well-being and enhancing recovery.



CHALLENGE ¹⁸

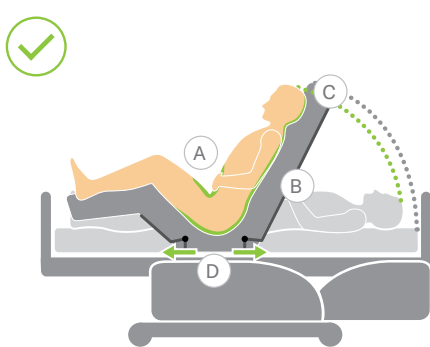
- Sleep deprivation with noise
- Pain & anxiety
- Restriction of movement caused by perfusion lines, tubes and cables

SOLUTION

Set of business class level features **increasing patient's comfort and autonomy, supporting well-being and faster recovery.**

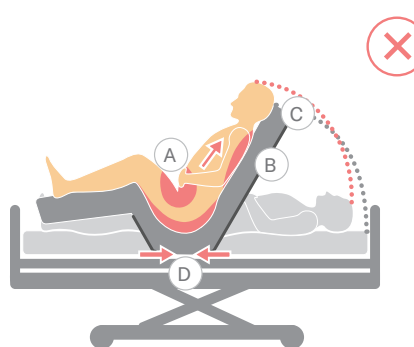
The Positive Effects of Ergoframe®

Ergoframe® reduces patient discomfort during positioning of the back and thigh rest.



Bed with Ergoframe®

Minimizes patient migration to the foot section, increased comfort in sitting position and protect patient of pressure injuries risk while positioning.

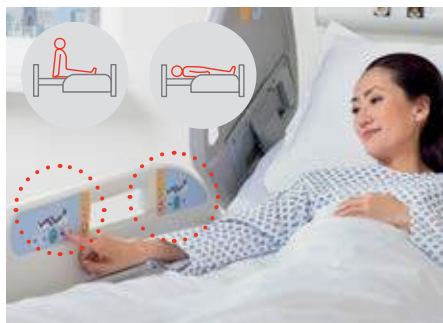


Standard bed

Most affected areas by extensive pressure and shearing forces.

- A) Reducing torso pressure
- B) Reducing shear forces
- C) Minimizing patient migration
- D) Enlarged space for comfortable seating position

Patient Controls Ergonomy



Patient can easily reach ergonomic bed controls while sitting or lying.

USB Integration



The integrated USB port allows for smart devices to be utilized for maintaining contact with family & friends and socialization.

Opticare® X Mobile Mode



Allows the mattress to be stepped down to a lower level of immersion to aid comfort and independent movement for more mobile patients.

Electrical Bed Extension



Extended bed contributes to comfort for tall patients.



SAFE PATIENT MOVING & HANDLING

Frame-based lateral tilt allows easier patient manipulation and reduces physical strain applied on the caregiver's back.




CHALLENGE

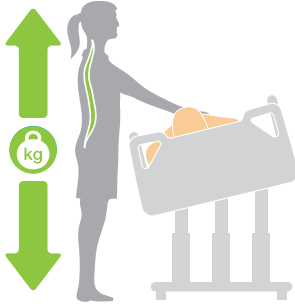
- The average MSD claim costs are reported between \$6,190 to \$93,225 (US)¹⁹
- The average low-back claim costs ranged from \$2,270 to \$14,235 (US)¹⁹
- 40% of sickness/absence in the NHS was related to musculoskeletal conditions in 2019 (UK)²⁰
- 47% back pain/injuries are most frequent MSD of health care workers leading to high increase of lack of time or staff²¹
- Need to reposition patient up to 35 times during 12h shift²²

SOLUTION

67% Decrease in the average force needed to turn the patient from the supine position onto their side when using lateral tilt.¹²


Lateral tilt helps in






Lateral tilt for ergonomically correct care

- Skin assessment
- Patient hygiene
- Positioning
- Bed making





The traditional way of turning the patient can lead to a back injury

Combined Tilting



Gravity reduces the physical strain applied on the caregiver's back during routine nursing care, reducing risks of musculoskeletal injuries.

Prone Mode



Opticare® X's Prone mode in combination with frame-based lateral tilt makes it easier to turn the patient to the prone position.

Mobi-Lift®



Reduces the physical effort for patient and caregiver and the number of caregivers needed to aid in the mobilization of patient.

Ergoframe® (Autocontour)



Patient is less likely to slide down in the bed when the back rest and thigh rest are elevated together. Caregivers do not need to repeatedly reposition the patient up the bed.



EASY PATIENT TRANSPORTATION

Effortless transportation thanks to the motorized i-Drive Power® 5th castor in combination with a 30% lighter bed frame.



CHALLENGE

- Pushing of occupied bed and patient transfer to stretcher/bed are high risk tasks for developing MSD²³
- Maneuverability of the bed in narrow hospital corridors
- Number of caregivers providing transfer: recommended 4 in case of a patient over 71.4kg²⁴

SOLUTION

30% Lighter bed frame in comparison with other ICU beds on market and i-Drive Power® system for easier manipulation and with minimum 5km range reduces the need to transfer the patient from the bed to a stretcher and back.²⁵

Patient transport made easy



i-Drive Power® with Safety Sense®



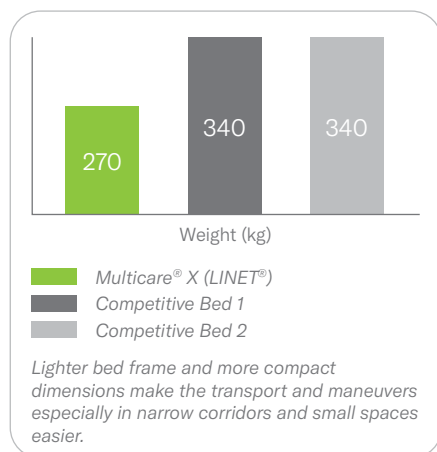
i-Drive Power® controller with intelligent Safety Sense® sensor which stops the bed automatically once the hand is removed.

IV & Drive

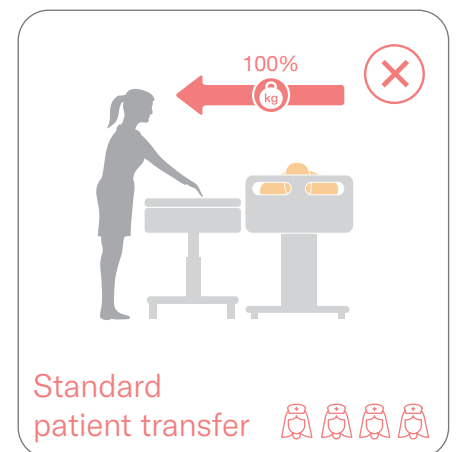


Combination of foldable IV poles and i-Drive controller for easy access to patient head and ergonomic drive.

Lighter bed frame



Easier patient transfer from bed to a stretcher²⁶





SIMPLIFY CAREGIVER PROCEDURES

The bed and integrated mattress can be **intuitively and predictively controlled from one screen**, which makes routine and advanced procedures more efficient for caregivers.



CHALLENGE

- Responsibility for high acuity levels of patients
- High volume of differing medical devices
- Alarm fatigue
- Complex procedures
- Documentation errors

SOLUTION

Simplified and easy-to-use controls of the bed and mattress thanks to the new 10" Multiboard X screen ergonomically positioned with the back rest at 30°.

Multiboard X – all controls in one screen

Training in the pocket Guides and hints

Integrated one-button hints and training videoguides for maximum utilization of the bed.

Precise medication Intuitive Scales

The scales offer simple interface with step-by-step guide.

One-button modes Integrated Mattress

Control automatic mattress modes from the same screen as the entire bed.

Efficient positioning One-Button Functions

Vascular leg, mobilization position and cardiac chair position reached with the push of a single button.

Enhancing safety Patient Controls Lock

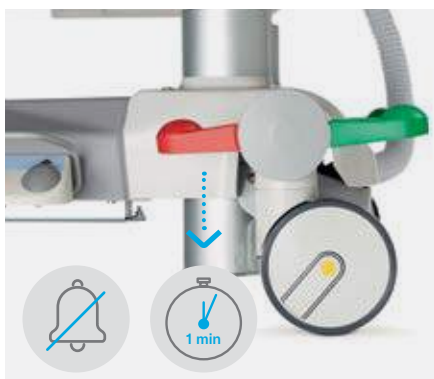
Selective blocking of patient's controls.

Programmable tilting Automatic Lateral Therapy

4 pre-defined and programmable scenarios for ALT.



Automatically engaged i-Brake®



Going beyond alarm: i-Brake® automatically engages after the bed is plugged into electricity.

One button CPR



Sophisticated CPR functionality brings the bed and mattress to the optimal position for resuscitation.

X-ray options

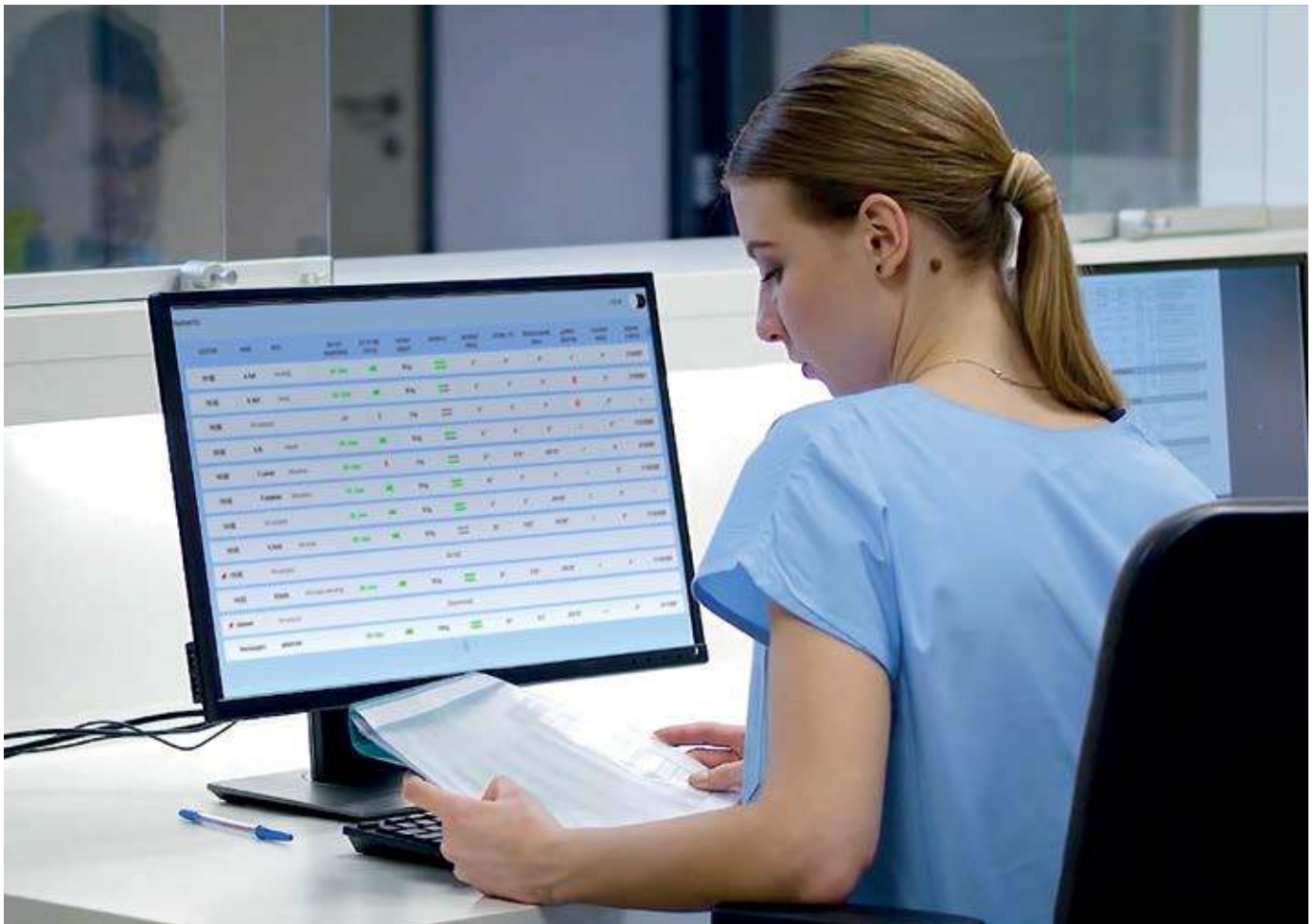


X-ray cassette holder and Opticare® X X-ray cassette sleeve for easier X-ray procedure without the need of transferring the patient.



HOSPITAL OPERATIONS EFFICIENCY

Lateral tilt makes time consuming routine tasks more efficient and our smart care solutions help with administration and patient overview.



CHALLENGE

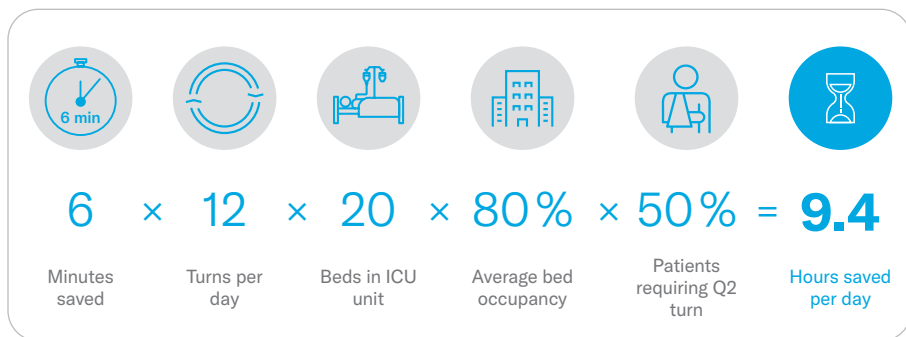
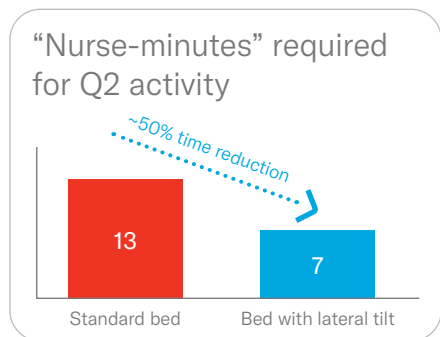
- Nurses feeling the burden of administrative tasks alongside caring for patients
- Long cleaning procedures due to high cleaning requirements
- Cost efficient technological upgrade of surfaces
- Time consuming patient repositioning

SOLUTION

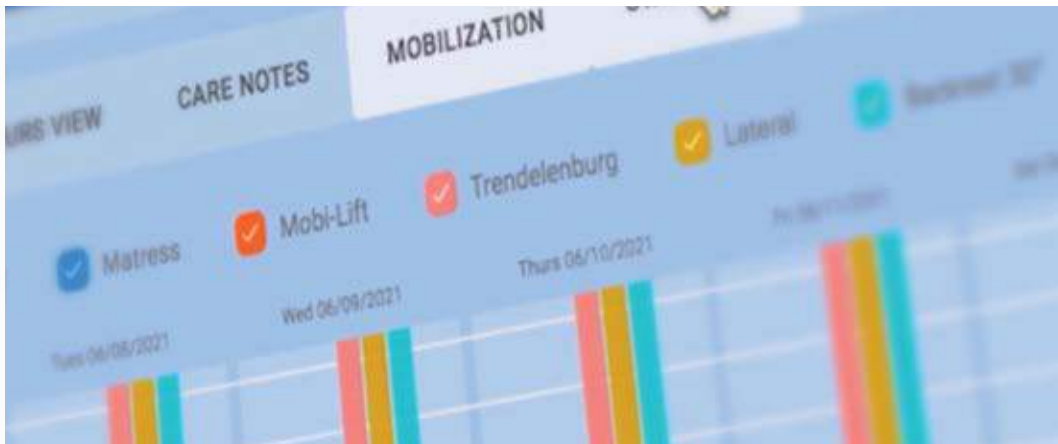
Save time for caregivers thanks to **frame-based lateral tilt** and **LINIS SafetyPort®**.

Save ~9 hours of nursing time per day with lateral tilt²⁷

Study across three facilities compared the time and resources needed to reposition patients with LINET®'s **frame-based tilt vs. a static frame resulting** in net time savings of ~9 hours of nursing time per day which can be used for other important activities.



LINIS SafetyPort®
 LINIS SafetyPort® collects data from 39 data points in the areas of patient safety, mobilization, bed management and bed utilization.



Open Mattress Architecture



Construction of the Multicare® X bed allows the use of active, hybrid and passive mattresses dependant upon the patient's individual needs.

Efficient Infection Control



Better access to entire the bed frame and seamless design make cleaning faster.

KEY FEATURES OVERVIEW

Intuitive controls

Multiboard X

New 10" screen with intuitive and predictive controls makes daily nursing tasks easier.



Easy transport

i-Drive

Effortless transport and easier maneuverability of the bed with motorized i-Drive Power®.



Better patient comfort

Ergoframe®

Unique LINET®'s frame design increasing patient comfort and reducing shear forces and friction during positioning.



Patient falls prevention

i-Brake®

Automatically engaged brake reduces the risk of patient fall caused by an unstable bed.



Effortless patient handling

Lateral tilt

Frame-based lateral tilt in combination with foot controls makes it easier and safer for the nurse to provide daily care and attend to the patient.



Easier mobilization

Mobi-Lift®

Patient can hold onto the Mobi-Lift® handle while sitting at the edge of the bed or attempting to stand.





Pulmonary support
Automatic Lateral Therapy

ALT can be programmed to perform tilting cycles according to individual clinical needs of the patient.



Stay in touch
Integrated USB

Patient can use charging port directly from the bed's head siderail to stay in touch with the family & friends.



Pressure injuries prevention
Opticare® X

Patented sensor technology in new generation of fully automatic integrated mattress Opticare® X.



Maximum safety
Siderails concept

Unique concept of Multicare® X siderails:

- 45cm height
- Constant gap
- Safety double mechanism
- Siderails down sensors
- 3/4 non-restrictive



Unique surface
Opticare® X Zoned Cover®

Dartex® Zoned Coatings designed with glide centre for easier patient repositioning and "grippy" edges supporting safe patient mobilization.

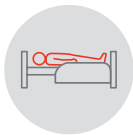


Special positioning
Combined tilting

Combined position of lateral tilt and anti Trendelenburg for easier postural drainage and physiotherapy.

TECHNICAL OVERVIEW

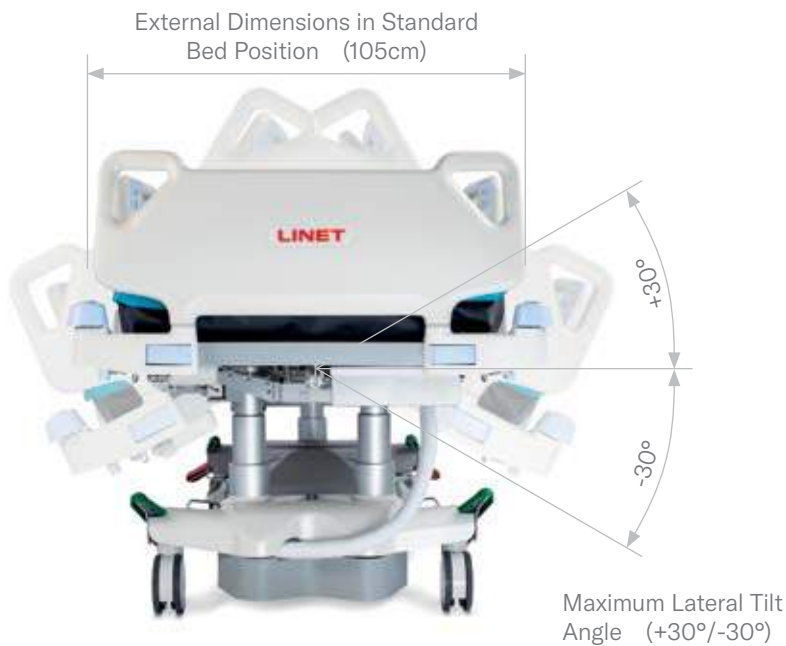
MULTICARE® X



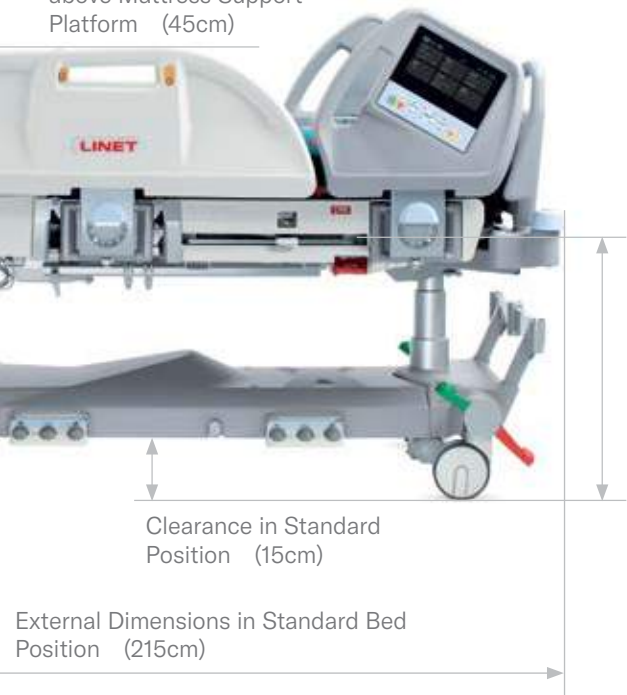
Maximum patient weight 185kg



Bed Safe Working Load (SWL) 250kg



Safety Siderail Height above Mattress Support Platform (45cm)



Clearance in Standard Position (15cm)

Minimum-Maximum Mattress support platform Height above floor (44 – 82cm)

External Dimensions in Standard Bed Position (215cm)



Maximum Back Rest Angle (70°)

OPTICARE® X

VIRTUOSO® PRO



Parameter	Opticare® X	Virtuoso® Pro
Technology	Optimal Immersion	3-cell alternating
Integrated	Yes	No
Microclimate Management	Yes	Yes
Modes	MAX, Mobile, Optimize, Prone	MAX, CLP, Alternating Pressure Therapy, Transport
Prone nursing	Automatic mode	Manual deflation of selected cells
CPR	1 button CPR, automatic inflation after 60 minutes	Operated by one hand
CPR deflation time	max. 30s	30s
Safe working load	250kg	254kg
Length	195cm – 214cm	204cm
Width	87cm	90cm
Height	23cm	23cm
Weight	15kg	13kg

REFERENCES

- Menges D, Seiler B, Tomonaga Y, Schwenkglens M, Puhán MA, Yebyo HG. Systematic early versus late mobilization or standard early mobilization in mechanically ventilated adult ICU patients: systematic review and meta-analysis. *Crit Care*. 2021 Jan 6;25(1):16. doi: 10.1186/s13054-020-03446-9. PMID: 33407707; PMCID: PMC7789482. <https://pubmed.ncbi.nlm.nih.gov/33407707/>
- Marti J, Hall P, Hamilton P, Lamb S, McCabe C, Lall R, Darbyshire J, Young D, Hulme C. One-year resource utilisation, costs and quality of life in patients with acute respiratory distress syndrome (ARDS): secondary analysis of a randomised controlled trial. *J Intensive Care*. 2016 Aug 11;4:56. doi: 10.1186/s40560-016-0178-8. PMID: 27525106; PMCID: PMC4982209. <https://pubmed.ncbi.nlm.nih.gov/27525106/>
- Kollef MH, Hamilton CW, Ernst FR. Economic impact of ventilator-associated pneumonia in a large matched cohort. *Infect Control Hosp Epidemiol*. 2012 Mar;33(3):250-6. doi: 10.1016/j.ichem.2011.12.009. Epub 2012 Jan 17. PMID: 22314062. <https://pubmed.ncbi.nlm.nih.gov/22314062/>
- Kaier K, Heister T, Wolff J, Wolkewitz M. Mechanical ventilation and the daily cost of ICU care. *BMC Health Serv Res*. 2020 Mar 31;20(1):267. doi: 10.1186/s12913-020-05133-5. PMID: 32234048; PMCID: PMC7106643. <https://pubmed.ncbi.nlm.nih.gov/32234048/>
- Ricl M, Borges JB, Tejkl L, Hladik D, Rezbáriková N, Mlček M. Respiratory and circulatory effects of lateral body positioning. *Linnet White paper*. 2020. Data upon request.
- Cardoso R, Parola V, Neves H, Bernardes RA, Duque FM, Mendes CA, Pimentel M, Caetano P, Petronilho F, Albuquerque C, Sousa LB, Malça C, Durães R, Xavier W, Parreira P, Apóstolo J, Cruz A. Physical Rehabilitation Programs for Bedridden Patients with Prolonged Immobility: A Scoping Review. *Int J Environ Res Public Health*. 2022 May 25;19(11):6420. doi: 10.3390/ijerph19116420. PMID: 35682005; PMCID: PMC9180781. <https://pubmed.ncbi.nlm.nih.gov/35682005/>
- Titworth WL, Hester J, Correia T, Reed R, Guin P, Archibald L, Layon AJ, Mocco J. The effect of increased mobility on morbidity in the neurointensive care unit. *J Neurosurg*. 2012 Jun;116(6):1379-88. doi: 10.3171/2012.2.JNS11881. Epub 2012 Mar 30. PMID: 22462507. <https://pubmed.ncbi.nlm.nih.gov/22462507/>
- Lebeda T et al Effect of Mobi-Lift® on patients mobilisation. NRU for Occupational Physiology and Psychophysiology, Report no: 3636/2021, ex. 210347. Data upon request
- Labeau SO, Afonso E, Benbenishty J, Blackwood B, Boulanger C, Brett SJ, Calvino-Gunther S, Chaboyer W, Coyer F, Deschepper M, François G, Honore PM, Jankovic R, Khanna AK, Llauro-Serra M, Lin F, Rose L, Rubulotta F, Saager L, Williams G, Blot SI; DecubICUs Study Team; European Society of Intensive Care Medicine (ESICM) Trials Group Collaborators. Prevalence, associated factors and outcomes of pressure injuries in adult intensive care unit patients: the DecubICUs study. *Intensive Care Med*. 2021 Feb;47(2):160-169. doi: 10.1007/s00134-020-06234-9. Epub 2020 Oct 9. Erratum in: *Intensive Care Med*. 2021 Apr;47(4):503-520. PMID: 33034686; PMCID: PMC7880913. <https://pubmed.ncbi.nlm.nih.gov/33034686/>
- Gefen A, Brienza DM, Cuddigan J, Haesler E, Kottner J. Our contemporary understanding of the aetiology of pressure ulcers/pressure injuries. *Int Wound J*. 2022 Mar;19(3):692-704. doi: 10.1111/iwj.13667. Epub 2021 Aug 11. PMID: 34382331; PMCID: PMC8874092. <https://pubmed.ncbi.nlm.nih.gov/34382331/>
- Wassel CL, Delhougne G, Gayle JA, Dreyfus J, Larson B. Risk of readmissions, mortality, and hospital-acquired conditions across hospital-acquired pressure injury (HAPI) stages in a US National Hospital Discharge database. *Int Wound J*. 2020 Dec;17(6):1924-1934. doi: 10.1111/iwj.13482. Epub 2020 Aug 23. PMID: 32830460; PMCID: PMC7949314. <https://pubmed.ncbi.nlm.nih.gov/32830460/>
- Lebeda T et al. Effect of lateral tilt on patients turning. NRU for Occupational Physiology and Psychophysiology. 2021 Report no: 3636/2021, ex. 210347
- EPUAP/NPIAP. Clinical practice guideline. 2019
- LeLaurin JH, Shorr RI. Preventing Falls in Hospitalized Patients: State of the Science. *Clin Geriatr Med*. 2019 May;35(2):273-283. doi: 10.1016/j.cger.2019.01.007. Epub 2019 Mar 1. PMID: 30929888; PMCID: PMC6446937. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6446937/>
- Dunne TJ, Gaboury I, Ashe MC. Falls in hospital increase length of stay regardless of degree of harm. *J Eval Clin Pract*. 2014 Aug;20(4):396-400. doi: 10.1111/jep.12144. Epub 2014 May 9. PMID: 24814338. <https://pubmed.ncbi.nlm.nih.gov/24814338/>
- Health Research & Educational Trust. (2016, October). Preventing patient falls: A systematic approach from the Joint Commission Center for Transforming Healthcare project. Chicago, IL: Health Research & Educational Trust. <http://www.hpoe.org/Reports-HPOE/2016/preventing-patient-falls.pdf>
- Francis-Coad J, Hill AM, Jacques A, Chandler AM, Richey PA, Mion LC, Shorr RI. Association Between Characteristics of Injurious Falls and Fall Preventive Interventions in Acute Medical and Surgical Units. *J Gerontol A Biol Sci Med Sci*. 2020 Sep 25;75(10):e152-e158. doi: 10.1093/gerona/glaa032. PMID: 31996903; PMCID: PMC7750680. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7750680/>
- Kalfon P, Mimoz O, Auquier P, Loundou A, Gauzit R, Lepape A, Laurens J, Garrigues B, Pottetier T, Mallédant Y. Development and validation of a questionnaire for quantitative assessment of perceived discomforts in critically ill patients. *Intensive Care Med*. 2010 Oct;36(10):1751-1758. doi: 10.1007/s00134-010-1902-9. Epub 2010 May 26. PMID: 20502874. <https://pubmed.ncbi.nlm.nih.gov/20502874/>
- Davis KG, Kotowski SE. Prevalence of Musculoskeletal Disorders for Nurses in Hospitals, Long-Term Care Facilities, and Home Health Care: A Comprehensive Review. *Hum Factors*. 2015 Aug;57(5):754-92. doi: 10.1177/0018720815581933. Epub 2015 Apr 21. PMID: 25899249. <https://pubmed.ncbi.nlm.nih.gov/25899249/>
- Musculoskeletal health in the workplace. Information on how to focus on prevention of work-related incidents that may lead to MSK injuries and therefore long-term absences. Jan 2019. <https://www.nhsemployers.org/articles/musculoskeletal-health-workplace#:~:text=Musculoskeletal%20%28MSK%29%20disorders%20can%20include%20back%20pain%2C%20neck,common%20reasons%20for%20sickness%20absence%20in%20the%20NHS.> Accessed 22.07.2022
- Musculoskeletal disorders in the healthcare sector. European Agency for Safety and Health at Work. June 2022. <https://osha.europa.eu/en/publications/musculoskeletal-disorders-healthcare-sector>
- Wilson TP, Davis KG, Kotowski SE, Daraiseh N. Quantification of Patient and Equipment Handling for Nurses through Direct Observation and Subjective Perceptions. *Advances in Nursing*. Vol 2015, Article ID 928537. Doi: 10.1155/2015/928538. <https://downloads.hindawi.com/archive/2015/928538.pdf>
- Waters TR, Nelson A, Proctor C. Patient handling tasks with high risk for musculoskeletal disorders in critical care. *Crit Care Nurs Clin North Am*. 2007 Jun;19(2):131-43. doi: 10.1016/j.ccell.2007.02.008. PMID: 17512469. <https://pubmed.ncbi.nlm.nih.gov/17512469/>
- Waters T, Baptiste A, Short M, Plante-Mallon L, Nelson A. AORN ergonomic tool 1: Lateral transfer of a patient from a stretcher to an OR bed. *AORN J*. 2011 Mar;93(3):334-9. doi: 10.1016/j.aorn.2010.08.025. PMID: 21353805. <https://pubmed.ncbi.nlm.nih.gov/21353805/>
- LINET internal testing. 2021 Data upon request.
- LINET internal testing. 2022 Data upon request.
- LINET internal calculation. 2022 Data upon request.



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